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(54) **LIFTING PLATFORM**

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CPC B66F 7/28; B66F 7/065; B66F 7/0625
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,287,965 A * 9/1981 Pearson B66F 7/28
187/219
4,776,569 A * 10/1988 Nestel-Eichhausen ... B66F 7/02
254/133 R

(Continued)

FOREIGN PATENT DOCUMENTS

CN 203612891 U * 5/2014
CN 105967100 A * 9/2016 ..... B25H 1/0007

(Continued)

OTHER PUBLICATIONS

International Search Report and Written Opinion for corresponding Patent Application No. PCT/EP2018/059088 dated Jul. 23, 2018.

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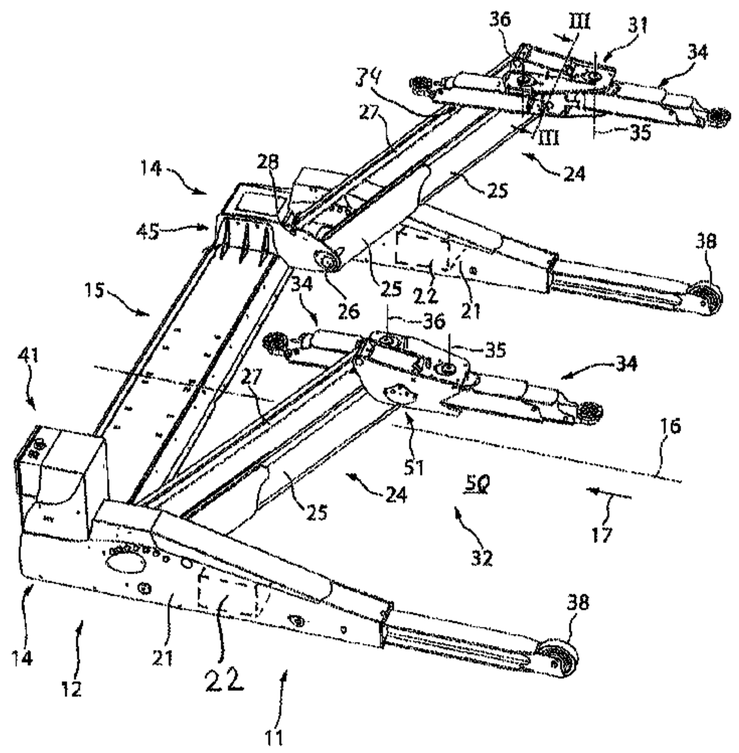
(57) **ABSTRACT**

The invention relates to a lifting platform for lifting vehicles, with two base assembly halves (**14**) with in each case one lifting device (**24**) arranged on the base assembly half (**14**), which includes a load arm (**25**) and a guiding arm (**27**), which arms, by means of at least one drive, are pivotably transferable out of a starting position arranged on the floor into an operating position (**32**), and which comprises a carrier (**31**) in in each case one end region of the lifting device (**24**), which carrier is mounted pivotably to the load arm (**25**) via a pivot bolt (**54**) and is mounted pivotably to the guiding arm (**27**) via a bearing bolt (**63**), and each carrier (**31**) receives at least one support arm (**34**) arranged pivotably thereon, so that the support arms (**34**) opposite one another are pivotable in a working space (**50**) formed at least between the lifting devices (**24**), wherein an angle of inclination is adjustable between the at least one support arm (**34**) and the lifting device (**24**).

19 Claims, 6 Drawing Sheets



(56) **References Cited**

U.S. PATENT DOCUMENTS

4,798,266	A	1/1989	Finkbeiner	
4,825,977	A *	5/1989	Isogai	B66F 7/02 187/206
5,025,892	A	6/1991	Stelzl	
6,213,451	B1 *	4/2001	Finkbeiner	B66F 7/08 254/124
8,869,943	B2 *	10/2014	Matthews	B66F 7/28 187/219
9,840,402	B2 *	12/2017	Horimizu	B66F 7/28
2004/0011594	A1 *	1/2004	Stewart	B66F 7/28 187/213
2012/0325587	A1 *	12/2012	Matthews	B66F 7/28 187/216

FOREIGN PATENT DOCUMENTS

DE	3830714	A1 *	3/1990	B66F 7/18
DE	36 05 650	C2	10/1994	
DE	202 07 646	U1	8/2002	
EP	0 336 927	A1	10/1989	
JP	H04-91991	U	8/1992	
JP	H09-156890	A	6/1997	
JP	2003-146594	A	5/2003	
WO	WO-2011095283	A1 *	8/2011	B25H 1/0007

* cited by examiner

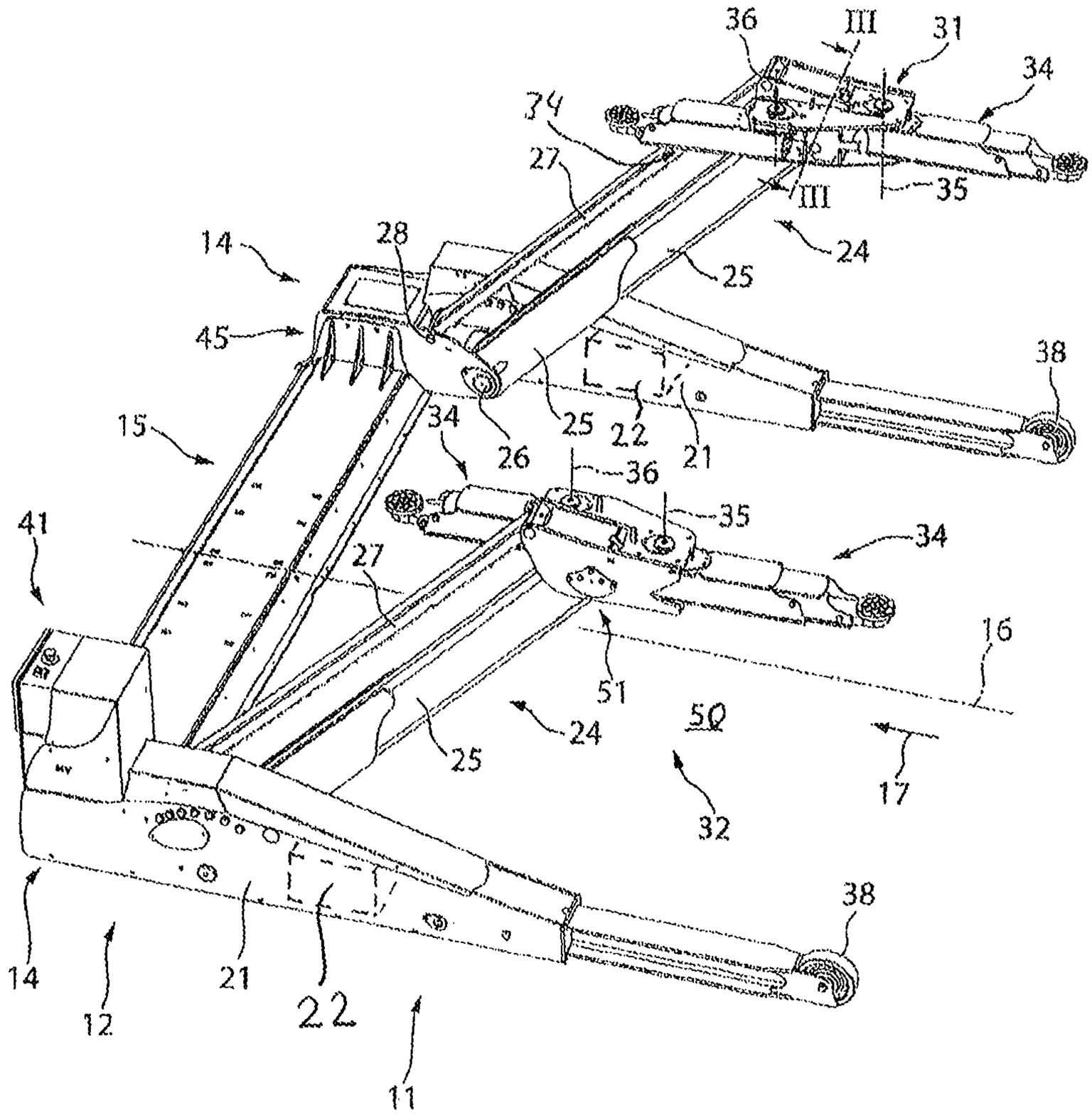

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Fig. 1

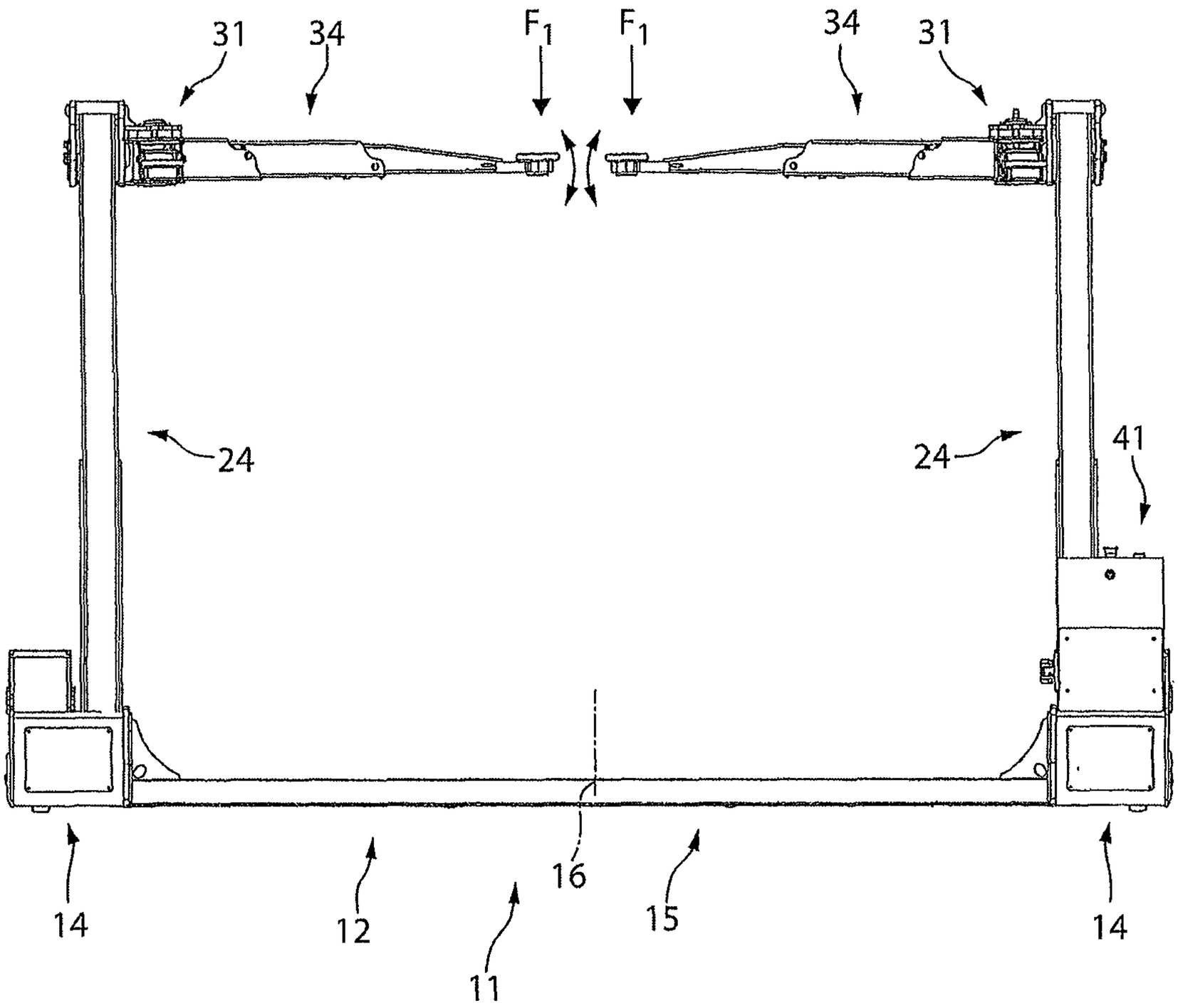

Fig. 2

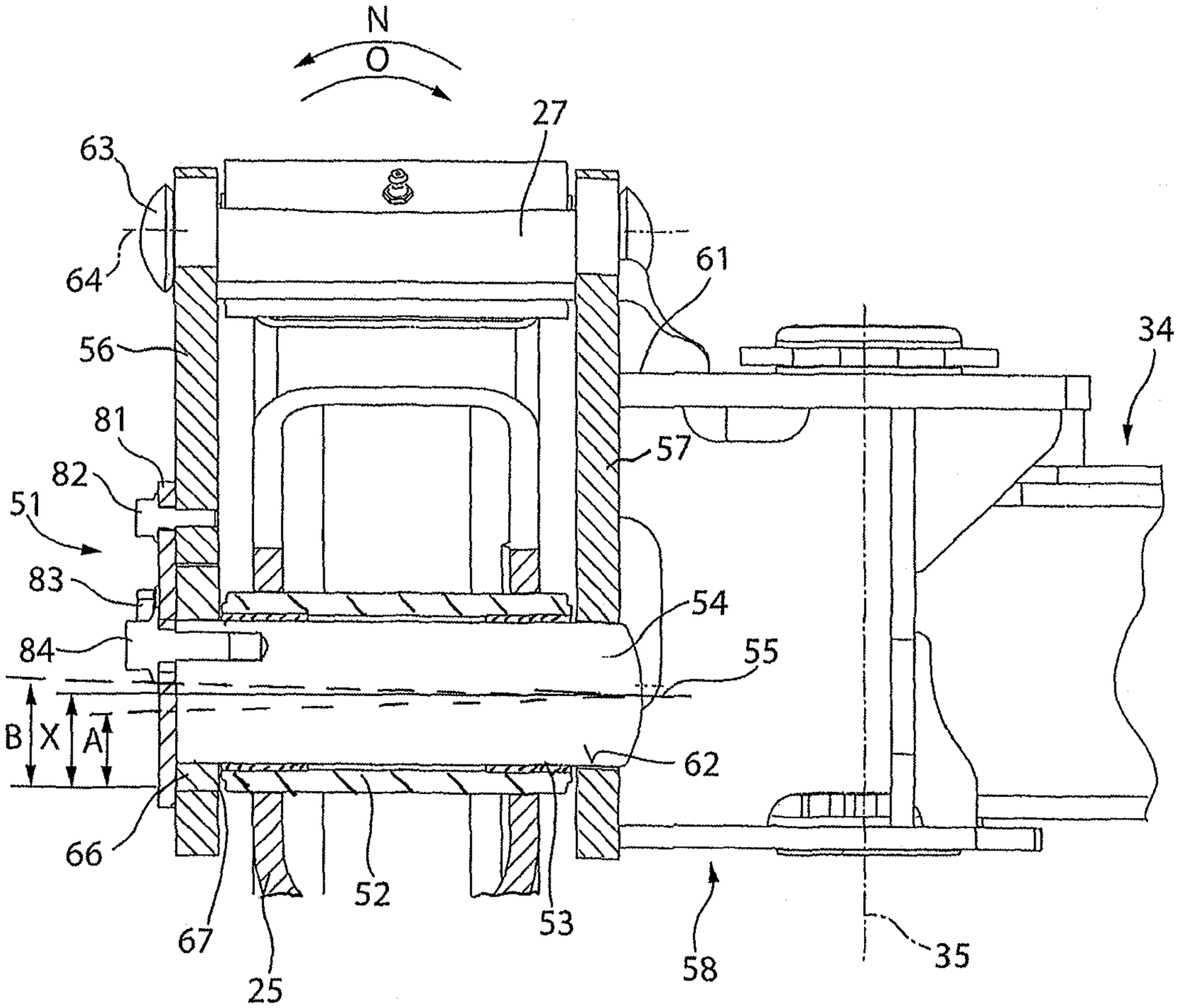

Fig. 3

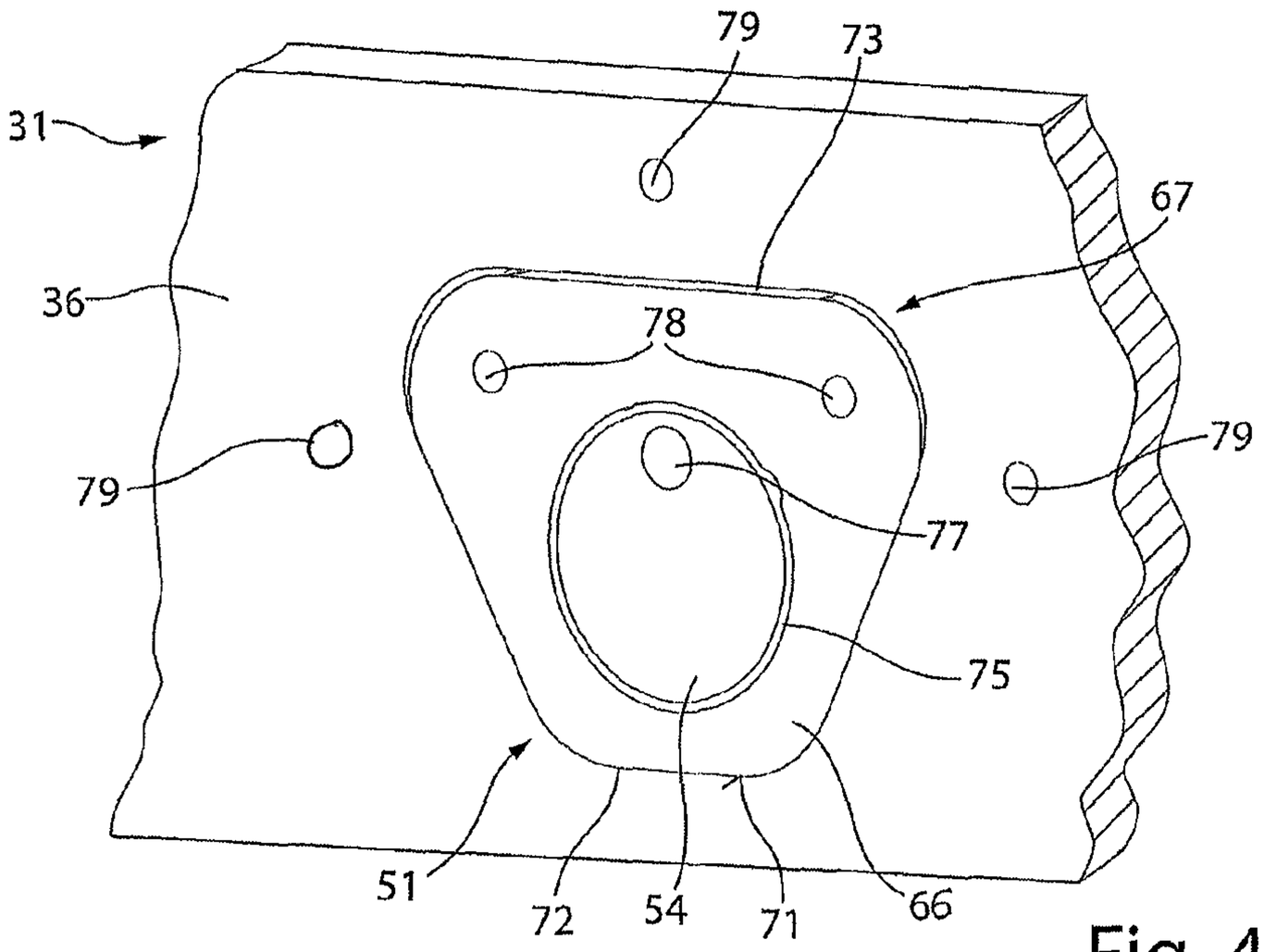
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Fig. 4

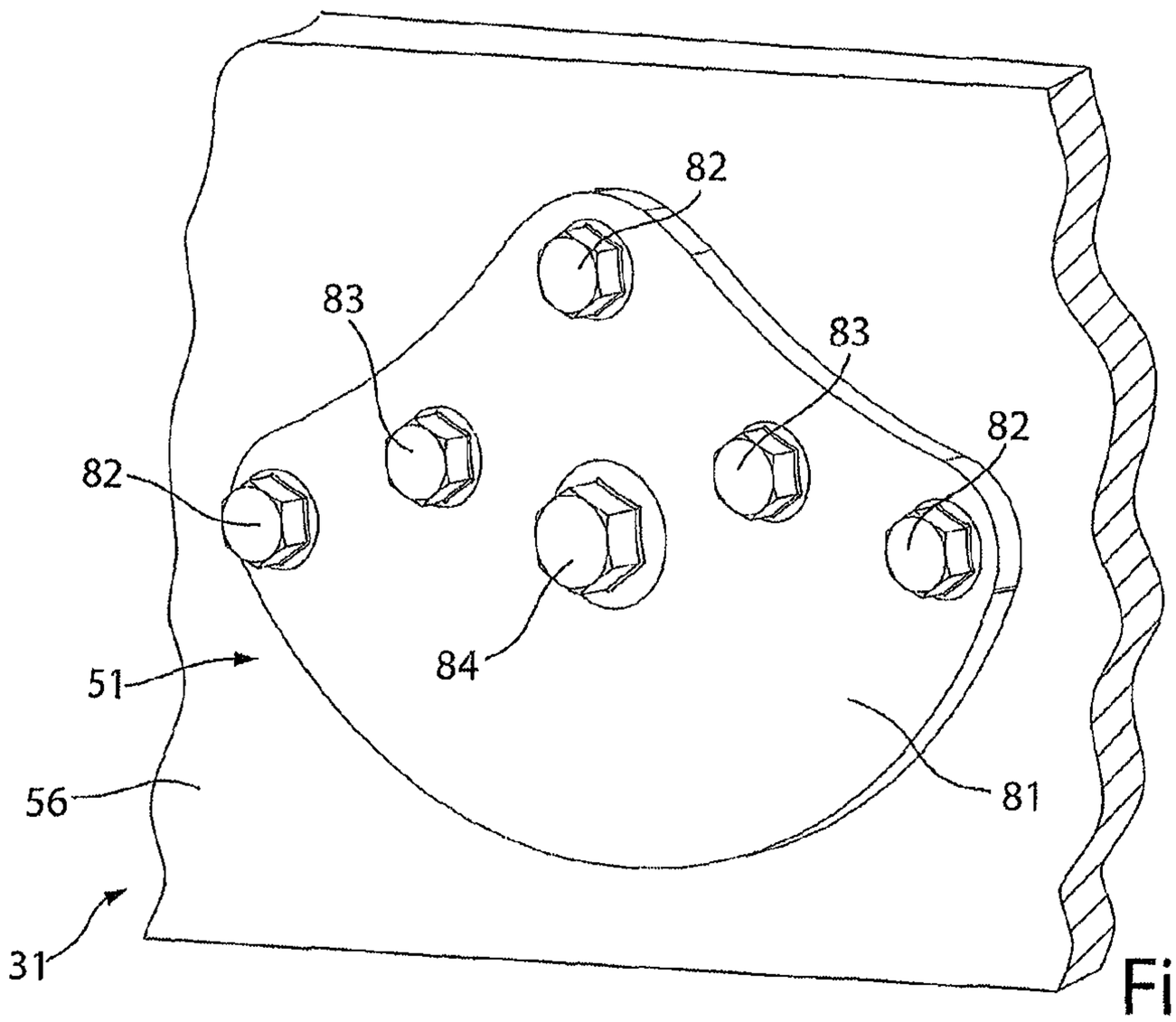
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Fig. 5

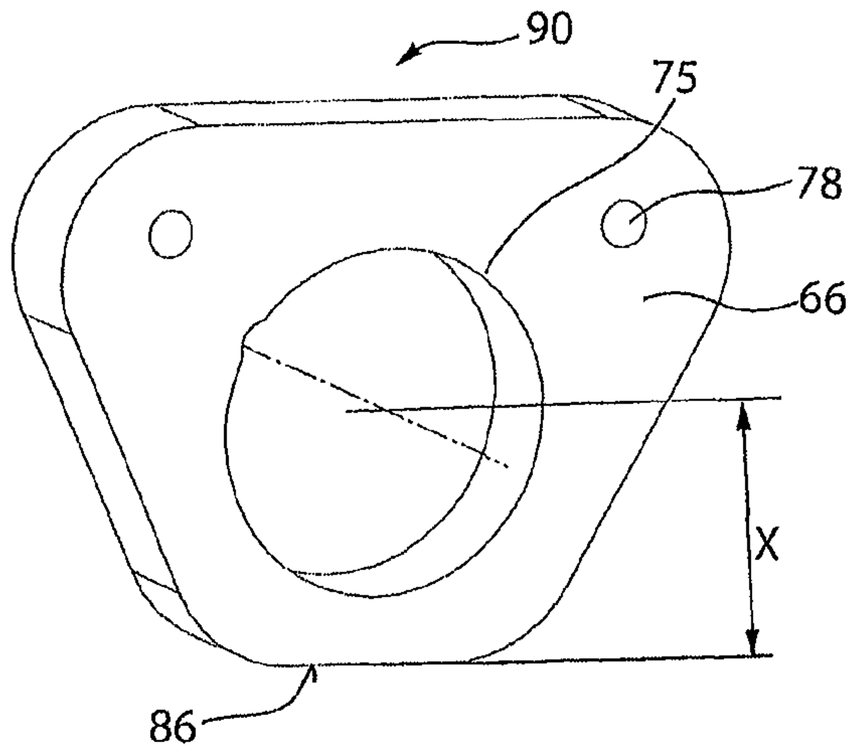

Fig. 6a

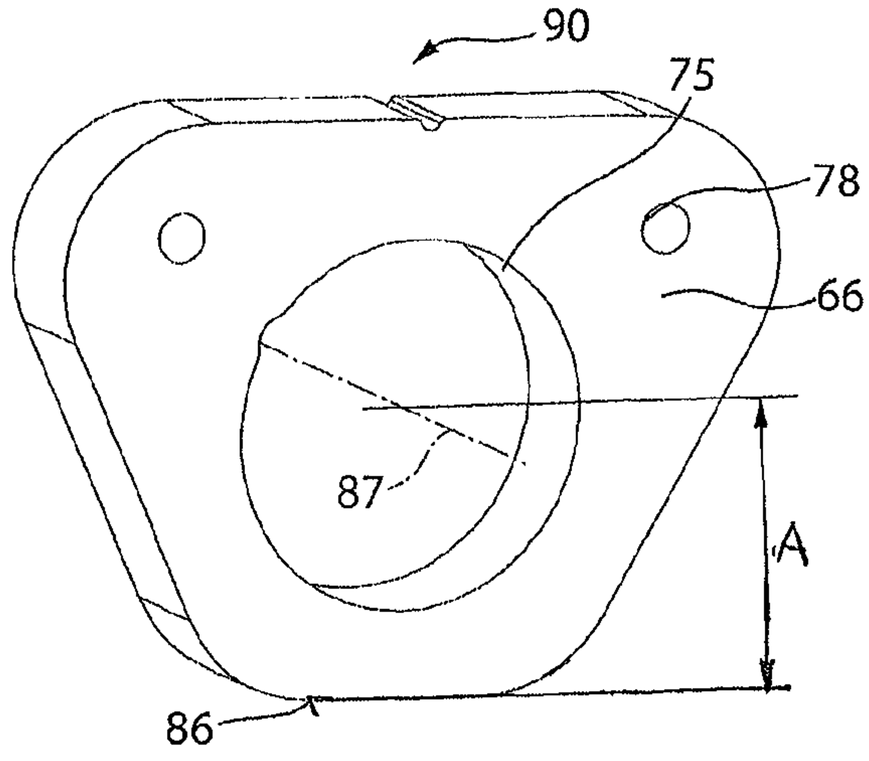

Fig. 6b

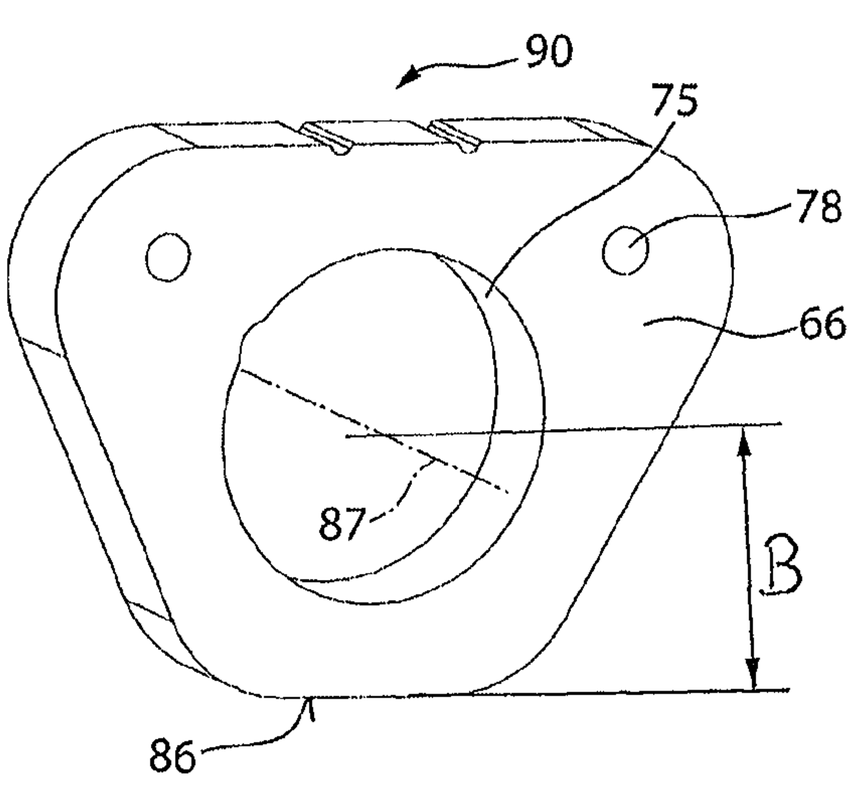

Fig. 6c

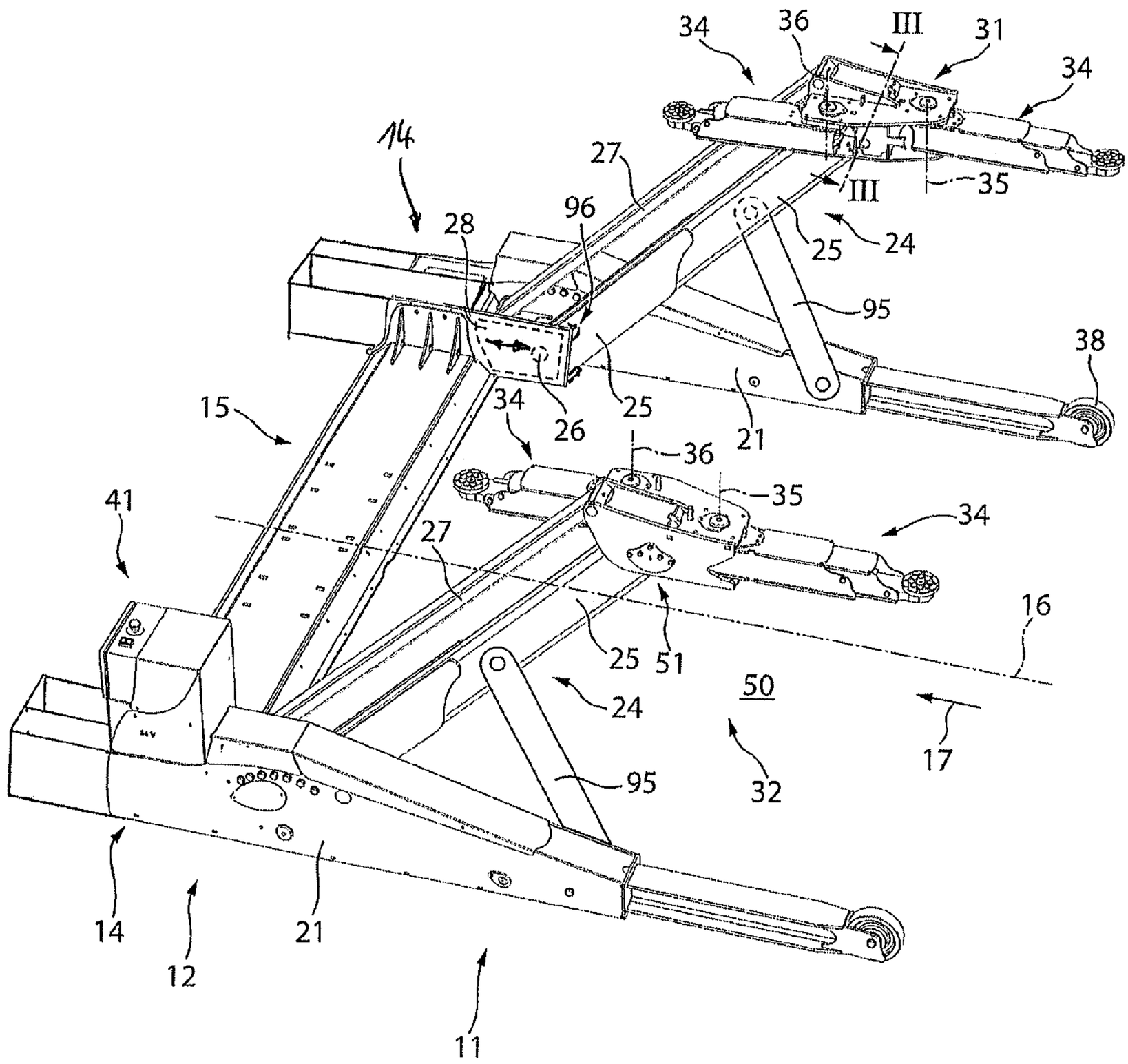
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Fig. 7

LIFTING PLATFORM

The invention relates to a lifting platform for lifting vehicles.

DE 36 05 650 C2 discloses a mobile hydraulic lifting platform for lifting vehicles in overhead. This movable lifting platform includes a base assembly which rests stationary when lifting vehicles. When not in operation, this lifting platform can be moved, by means of a chassis, into a further operating or storage position. The base assembly of the lifting platform includes two base assembly halves, as well as a middle part, wherein the two base assembly haves are fixedly connected with one another and arranged to one another via the middle part. Each base assembly half comprises a drive, by means of which a parallelogram guiding device of the base assembly half is moveable up and down. This parallelogram guiding device includes a load arm and a guiding arm so that a carrier arranged on the free end region remains horizontally oriented in the raising and lowering of the parallelogram guiding device. The carrier provided on the parallelogram guiding device receives two support arms pivotably arranged on the carrier. These support arms can be pivoted out of a non-use position, in which the support arms are oppositely oriented and are positioned parallel to the parallelogram guiding device, into a use position, in order to lift up a vehicle entered between the base assembly halves and the lifting platform.

Each base assembly half is fastened to the middle part, which is configured in the form of a protective tube. The middle part comprises a flange portion on the respective end, which portion is screwed to a lateral surface of the housing of the base assembly half.

Due to dimensional tolerances, an orientation of the support arms differing from one another in an operating position inside the working space, in which the vehicle is lifted up, can be the case after the assembly. A readjustment or setting via the connecting point between the base assembly half and the middle part is difficult and only possible to a limited extent.

The object underlying the invention is to provide a lifting platform in which the support arms are orientable to one another in a simple way.

This object is achieved by a lifting platform, in which an angle of inclination between the support arm and the lifting device is adjustable. The support arms opposite one another can thereby be oriented pivotably to one another, for example, in a common horizontal. The support arms opposite one another can also be oriented such that these are located slightly above the horizontal with their free ends so that, when receiving a load, the support arms are located near to the horizontal or in the horizontal, for example. By altering the angle of inclination between the support arm and the lifting device, an individual adapting of the at least one support arm of each base assembly half can occur, so that the support arm(s) arranged on a right lifting device is or are adjustable independently of the support arm(s) provided on a left lifting device.

It is preferably provided that an adjustment device is provided between the carrier and the lifting device or between the support arm and the carrier in order to adjust the angle of inclination between the support arm and the lifting device. An individual orientation of the at least one support arm can thereby be made possible, in particular when positioning the carrier with the at least one support arm in an operating position. The operational safety can be increased through the orientation of the support arms, in particular in a common horizontal.

According to a preferred embodiment of the lifting platform, it is provided that, by means of the adjustment device, the carrier is adjustable, for the orientation of the support arms, in the inclination to the pivot axis of the pivot bolt and/or to the bearing axis of the bearing bolt, or to both. The pivot axis and the bearing axis on the one lifting device are oriented parallel to one another. This pivot and bearing axes of the one lifting device preferably align with the pivot and bearing axes of the opposite parallelogram guiding device. The adjustment of inclination of the carrier occurs to the effect that the carrier is rotatable or tiltable about its longitudinal axis. The longitudinal axis of the carrier extends orthogonally to the pivot axis of the pivot bolt and the bearing axis of the bearing bolt. Through the inclination of the carrier, a free end of the support arm, which end is pivoted into the working space, can be alterable in the height with respect to the floor, whereby an orientation of the support arms assigned to each other, in particular in a common horizontal, is made possible.

The adjustment device preferably includes a compensation plate with a borehole, which is placeable on an end of the pivot bolt or of the bearing bolt and is fastenable on or in the carrier. By means of this compensation plate, the carrier can be arrangeable in a zero point position, that is orthogonally to the parallelogram guiding device, or in a position rotated or tilted to the pivot axis or to the bearing axis. In this rotated or tilted position, a few angular degrees are already sufficient in order to effect an orientation of the support arms.

The carrier of the moveable lifting platform advantageously comprises at least two lateral walls spaced parallel to one another, which in each case comprise a perforation for the pivot bolts and the bearing bolts. In place of the perforation, a centering receptacle is provided in one of the two lateral walls, in which receptacle the compensation plate, which plate receives the pivot bolts or bearing bolts, can be inserted, and is supported in the lateral wall. The carrier, with respect to the positioning of the pivot bolt or bearing bolt in the one lateral wall of the carrier thereby remains at the same height to the pivot or bearing axis, and the opposite lateral wall of the carrier can take a greater or lesser distance relative to the pivot or bearing axis. This rotational or tilting movement of the carrier effects the adjustment of the free end of the carrier in the height to the floor or to the opposite carrier. Preferably, taking the greater or smaller distance to the pivot or bearing axis is provided on an outer side of the carrier, that is the side which lies remote to a longitudinal center axis of the lifting platform.

Moreover, it is preferably provided that the centering receptacle in the lateral wall is configured V-shaped or trough-shaped, narrows in a load direction and that the compensation plate comprises a complementary external contour, so that said contour rests form-fittingly in the centering receptacle. It is thereby ensured, in a loading of the lifting platform, that the force to be received, which force is introduced into the carrier via the support arms and is diverted from the carrier via the bolts in the parallelogram guide, can be securely introduced, by the compensation plate, into the lateral wall via the centering receptacle.

A further preferred configuration of the lifting platform provides that a retaining device is provided for fixation of the compensation plate in the centering receptacle, which device is detachably provided on a lateral wall, in particular on an external side of the lateral wall. A good accessibility and a simple mounting and unmounting of the retaining

device, as well as a simple exchanging of a compensation plate are thereby made possible in order to set different angles of inclination.

Preferably, the retaining device is configured as a retaining plate, which includes at least one detachable fastening element, by means of which the retaining plate is fastenable with the lateral wall. Preferably, at least one retaining element is provided, through which the compensation plate is detachably fixated to the retaining plate. Moreover, a fixation element is preferably provided, through which the retaining plate is detachably fixable to the pivot bolt or bearing bolt. Preferably, the at least one fastening element, retaining element and fixation element engage on the retaining plate of the at least one fastening element. All components are thereby secured to one another.

Moreover, it is preferably provided that the retaining plate completely covers the centering receptacle in the lateral wall in the mounted position. A substantially closed lateral wall of the carrier can thereby be achieved, whereby a risk of injury is diminished.

Advantageously, multiple compensation plates are provided for one adjustment device, which plates deviate from one another in the distance between a reference surface provided on the compensation plate and a longitudinal center axis of the borehole. An alteration in the angle of inclination of the carrier to the pivot axis or bearing axis can thereby be adjusted. Preferably, markings or information are provided on the compensation plates, in order to signal to the user the respective distance which is adjustable using this compensation plate.

A further preferred embodiment of the lifting platform provides that the pivot bolt and the bearing bolt are rotatably received, by means of a radial bearing, about a stationary pivot and bearing axis, to the load arm and guiding arm. It is thereby made possible that the carrier is rotated about its longitudinal axis only by means of the adjustment device, that means that this carrier can be altered, clockwise and counterclockwise, to the longitudinal center axis of the lifting platform, in its position.

A preferred embodiment of the lifting platform provides that a base assembly, stationary in the lifting of vehicles, is provided, which assembly includes two base assembly halves, which are fixedly arranged to one another, via at least one preferably detachable connecting point, with a middle part.

Moreover, it is provided, in an advantageous configuration of the lifting platform, that a lifting device, in particular a parallelogram guiding device or a scissoring guide device, is arranged on each base assembly half, which device preferably includes a load arm and a guiding arm which, by means of at least one drive arranged on or in the at least one base assembly half, are transferrable out of a starting position arranged on the floor into an operating position, and which receives a carrier respectively in an end region of the lifting device, in particular of the parallelogram guiding device or the scissoring guide device, which carrier is mounted pivotably to the support arm via a pivot bolt and is mounted pivotably to the guiding arm via a bearing bolt, and each carrier receives at least one support arm pivotably arranged thereon, so that the support arms opposite one another are pivotable in a working space formed at least between the lifting devices, in particular parallelogram guiding devices or between the scissoring guide devices.

The lifting platform is configured in particular as a moveable lifting platform, so that this platform is positionable at the respective use site.

The invention, as well as further advantageous embodiments and further developments of the same are described in further detail and explained in the following based on the examples illustrated in the drawings. The features to be taken from the description and the drawings can be applied according to the invention individually or multiply in any combination. Shown are in:

FIG. **1** a perspective view of the lifting platform according to the invention,

FIG. **2** a schematic front view onto the lifting platform according to FIG. **1**,

FIG. **3** a schematic partial section along the line III-III in FIG. **1**,

FIG. **4** a schematic view onto a mounting position of the adjustment device according to FIG. **3**,

FIG. **5** a schematic side view onto an adjustment device on the carrier,

FIGS. **6***a* to **6***c* perspective views onto compensation plates of the adjustment device, different from one another, according to FIG. **4** and

FIG. **7** a perspective view of an alternative embodiment of the lifting platform to FIG. **1**.

FIG. **1** shows a perspective view of a lifting platform **11** according to the invention. This lifting platform **11** includes a base assembly **12** which includes two base assembly halves **14** and a middle part **15** arranged therebetween. Through the middle part **15**, the base assembly halves **14** are preferably distanced and oriented parallel to one another. By means of the base assembly halves **14** and the middle part **15**, a U-shaped base assembly **12** is formed. The open region constitutes an entry region in a working space **50** for a vehicle, which enters for so long until this vehicle is positioned near the middle part **12**. The entry direction is illustrated according to arrow **17** in the perspective view of the lifting platform **11** in FIG. **1**. The entry direction lies in the region of a longitudinal center axis **18** of the lifting platform **11**. The longitudinal center axis **18** extends parallel between the two base assembly halves **14** and is arranged centrally thereto. The working space **50** extends at least between the two base assembly halves **14**.

Each base assembly half **14** includes a housing **21**, inside of which a schematically illustrated drive **22** is provided. Moreover, each base assembly half **14** receives a lifting device **24** which is configured, in this exemplary embodiment, as a parallelogram guiding device. Alternatively, the lifting device **24** can be configured as a scissoring guide device, in particular half-scissor, full scissor or double scissor. The at least one drive **22** lifts and lowers the lifting device **24**. This lifting device **24** includes a load arm **25**, which is pivotable about a first pivot axis **26**. Moreover, the lifting device **24** includes a guiding arm **27**, which is pivotable about a second pivot axis **28**, which axis is distanced to the first pivot axis **26**. Both pivot axes **26**, **28** are mounted on the housing.

The lifting device **24** comprises a carrier **31** on an end region remote to the housing **21**, which carrier remains oriented horizontally through the lifting device **24** during the raising and lowering of the lifting device **24**. In FIG. **1**, the lifting devices **24** are provided in an operating position **32**. Such an operating position **32** can correspond to an overhead height. In a non-operating position, the lifting devices **24** are positioned oriented near the floor or resting upon the floor.

Each carrier **31** receives at least one support arm **34**. Preferably, two support arms **34** are respectively provided on the carrier **31**. These support arms **34** are pivotably mounted about in each case one pivot axis **35**, **36**. The support arms **34** can be configured to have the same length. Alternatively,

the rear support arm facing towards the entry region can be configured longer than the in particular front support arm **34** facing towards the middle part **15**. The support arms **34** are preferably configured as telescoping support arms.

The lifting platform **11** is preferably configured as a moveable lifting platform **11**. Each base assembly half **14** preferably comprises a running roller **38** at an end remote to the middle part **15**, which roller is part of a chassis. Moreover, a drawbar not illustrated in further detail can be fastenable, in a middle region, to the middle part **15**, so that after lifting the middle part, the lifting platform **11** bis supported on an impeller of the drawbar and the two running rollers **38**. The lifting platform **11** is thereby mobile and can be moveable to the respective use site. After the removal of the drawbar, this lifting platform **11** is stationary and rests on the floor.

Alternatively to the lifting platform **11** illustrated in FIG. **1**, this platform can also be configured as a stationary lifting platform **11**. In this case, the running rollers **38** can be dispensed with. In a stationary lifting platform **11**, it can also be provided that this platform consists of the two base assembly halves **14** oriented towards one another. A middle part **15** can be provided or also be dispensed with.

A controller **41** is provided for the actuation of the lifting platform **11** out of a non-operating position into an operating position **32**, which controller is for example arranged on one of the two base assembly halves **14**. This controller **41** can output a control signal to the respective drive(s) **22**. The drive **22** can be a hydraulic cylinder which is electrically actuatable. Preferably, a drive **22** is provided in each housing **21** of the base assembly half **14**. The controller **41** includes monitoring sensors to for the synchronization of the lifting and lowering movement of the respective lifting device **24**. Control lines can, on the one hand, be guided into the directly assigned base assembly half **14** by the controller **41**. On the other hand, control lines can be guided inside the middle part **15** to the opposite base assembly half **14**.

FIG. **2** illustrates a schematic front view onto the lifting platform **11** according to FIG. **1**, in the operating position **32**. The force acting on the support arms **34** is symbolized through the force F**1**, which force acts in a vehicle lifted in the operating position **32**. To increase the operational safety, it is required that the at least two support arms **34** opposite one another are oriented nearly or in a common horizontal. A skewed positioning of the vehicle in the operating position **32** can thereby be prevented.

Due to dimensional tolerances of the first and second base assembly half **14**, the case can arise that the support arm(s) **34** of the first base assembly half **14** and/or the support arm(s) **34** of the second base assembly half **14** are not oriented towards one another and/or lie outside of the horizontal. Here, the free ends of the support arms can be oriented above or below the horizontal.

At least one adjustment device **51** is provided on each base assembly half **14**, through which device the inclination of the least one support arm **34** of the lifting device **24** is adjustable. Preferably, an angle of 90° is provided between the at least one support arm **34** and the lifting device **24**. Insofar as the lifting device **24** is oriented in an elevated position outside of the vertical, however, the setting of the inclination of the at least one support arm **34** is required, so that this arm, in turn, is oriented in the horizontal.

According to a preferred embodiment, the adjustment device **51** is provided between the carrier **31** and the lifting device **24**. The adjustment device **51** is preferably provided on an external side of the carrier **31**. This device can also be provided on an internal side of the carrier **31**.

FIG. **3** illustrates a schematic sectional view along the Line III-III in FIG. **1**. This schematic partial section extends through an upper end region of the lifting device **24**, as well as a part of the carrier **31**.

A bearing bush **52** is provided in the upper end region of the load arm **25**, which bush receives a radial bearing **53**, through which a pivot bolt **54** is pivotably mounted about a pivot axis **55**, with respect to the load arm **25**. The carrier **31** comprises at least a first lateral wall **56** and a second lateral wall **57**, which are preferably distanced parallel to one another. The first lateral wall **56** forms an external side of the carrier **31**. The second lateral wall **57** forms an internal side of the carrier **31**. A support arm bracket **58** is provided on this second lateral wall **57**, which bracket pivotably receives the support arm **34** about a bearing axis **35**, **36**. The two lateral walls **56**, **57** are kept at a distance to one another by means of a head plate **61**.

The carrier **31** is connected with the guiding arm **27**, remote to the pivot bolt **54**, by means of a bearing bolt **63**. The guiding arm **27** is thereby pivotably mounted about the one bearing axis **64** of the bearing bolt **63**. By means of receiving of the carrier **31**, via the pivot bolt **54** and bearing bolt **63**, the carrier **31** can be oriented horizontally during the lifting and lowering of the lifting device **24**.

The adjustment device **51** acts, according to the preferred embodiment, between the pivot bolt **54** and the carrier **31**. Alternatively, the adjustment device **51** can also be provided on the bearing bolt **63**. Likewise, the adjustment device **51** can be provided on the pivot bolt **54**, as well as on the bearing bolt **53**. The structure of the adjustment device remains the same in the alternative embodiments.

The adjustment device **51** includes a compensation plate **66** which is positioned in a centering receptacle **67** in the lateral wall **56**. This is illustrated in FIG. **4** in a side view. The centering receptacle **67** in the lateral wall **56** has a V- or trough-shaped contour **71** which tapers in a force direction according to Force F**1**. The centering receptacle **67** can be configured in a trapezoidal. A lower lateral edge **72** of the trapezoidal centering receptacle **67** is shorter than the opposite or upper lateral edge **73**. The compensation plate **66** preferably has a complementary external contour. In a load acting on the support arms **34**, the V- or trough-shaped region of the centering receptacle **67** is supported on the complementary region of the compensation plate **66**, which region in turn transfers the force onto the pivot bolt **55**.

The compensation plate **66** includes a borehole **75**, into which an end of the pivot bolt **54** engages, insofar as compensation plate **66** is positioned in the centering receptacle **67**.

The pivot bolt **54** comprises at least one borehole **77** on its end face. The compensation plate **66** likewise comprises at least one borehole **78**. Outside of the compensation plate **76**, at least one further borehole **79** is provided in the lateral wall **56**.

FIG. **3** shows a retaining device **81** of the adjustment device **51** in a sectional view, which device in represented in an enlarged side view in FIG. **5**. This retaining device **81** is configured as a retaining plate, which is fixedly connected with the lateral wall **56** by means of at least one detachable fastening element **82**, in particular a screw, in that the at least one fastening element **82** engages into the borehole **79**. Moreover, it is preferably provided that at least one detachable retaining element **83**, in particular a screw, is provided for fixation of the compensation plate **66** to the retaining device **81**, which screw engages into the at least one borehole **78**. Advantageously, at least one detachable fixation element **84**, in particular a screw, is provided, which

engages into at least one borehole **77** of the pivot bolt **55**. It is thereby made possible that the adjustment device **51** allows for a firm connection between the carrier **31** and the lifting device **24**.

The adjustment device **51** illustrated in the FIGS. **3** to **5** allows for adjusting the carrier **31**, to the lifting device **24**, in a zero point position. The lateral walls **56**, **57** are oriented perpendicular to the pivot axis **55**. The pivot bolt **54** and bearing bolt **63** are respectively mounted in a perforation **62** in the lateral wall **56**, **57**, insofar as no adjustment device **51** is provided. The borehole **75** in the compensation plate **66** is arranged inside the compensation plate **66** in such a manner that the distance X according to FIG. **3** can be assumed. The distance X corresponds to a distance which is defined by the reference surface **86** of the compensation plate **66** and a longitudinal axis **87** of the borehole **75**, as can be taken from FIG. **6***a*.

Insofar as the support arm **34** now inclines in direction onto the floor and lies below the horizontal, in the use of a compensation plate **66** for a zero position, the compensation plate **66** can be exchanged according to FIG. **4***a* and be employed by means of a compensation plate **66** according to FIG. **6***b*. In this compensation plate **66**, a distance A is provided between the reference surface **86** and the longitudinal axis **87** of the borehole **75**, which is smaller in distance than the distance X. The carrier **31** is thereby pivoted in a direction according to arrow N, wherein the lateral wall **57**, to the pivot bolt **54**, forms a kind of rotary bearing, in order to effect the pivoting movement of the carrier **31** to the pivot bolt **55**.

The exchange of the compensation plate **66** occurs to the effect that the fastening elements **82**, retaining elements **83** and fixation elements **84** provided on the retaining device **81** are detached, as well as the retaining plate being removed. Subsequent thereto, the compensation plate **66** is taken out of the centering receptacle **67** and the desired new compensation plate **66**, in turn, is placed upon the pivot bolt **54** and inserted into the centering receptacle **67**. The retaining device **81** is, in turn, affixed with the at least one fastening element **82**, retaining element **83** and fixation element **84**. The new orientation of the support arm **34** is fixed.

Insofar as the end of the support arm **34** lies above a horizontal, originating from the adjustment device **51**, with a zero position, it is necessary to lower the free end of the support arm **34**. In such a case, a compensation plate **66** can be used according to FIG. **6***c*, in which the distance B between the reference surface **86** and the longitudinal axis **86** of the borehole **75** is greater than the distance X. Thereafter, the carrier **31** is inclined in the direction of arrow O and the free end of the support arm **34** is lowered.

The adjustment device **51** is preferably provided with multiple compensation plates **66**, which have different distances between the reference surface **86** and the longitudinal axis **87**, in order to make an individual adjusting and adapting of the support arms **34** possible.

The compensation plates **66** can comprise markings **90**, through which these plates can be differentiated from one another. For example, these can be indentations, as these are illustrated in FIGS. **6***b* and **6***c*. Likewise, numbers or other symbols can be applied. Colored markings are also possible.

FIG. **7** illustrates an alternative configuration of the lifting platform **11** with respect to FIG. **1**. This lifting platform **11** is different to the embodiment in FIG. **1** with respect to the configuration of the lifting device **24**. In FIG. **1**, the lifting device **24** is configured as a parallelogram guiding device. In the embodiment in FIG. **7**, the lifting device **24** is configured as a half scissor. This half scissor comprises a strut **95** which, on the one hand, is pivotably mounted on the load arm **25** and, on the other hand, is pivotably mounted on the housing **21** of the base assembly half **14**. The carrier **31** is guided oriented horizontally in this half scissor through the load arm **25** and the guiding arm **27**. An opposite end of the load arm **25** and of the guiding arm **27** is pivotably mounted in a moveable carriage **96**. This moveable carriage **96** is illustrated in a dashed-line manner. This moveable carriage **96** is guided horizontally movably through the housing **21** of the base assembly half **14**.

The invention claimed is:

1. A lifting platform for lifting vehicles, comprising:

two base assembly halves,

each base assembly half comprising a lifting device arranged thereon, in which the respective lifting devices are spaced apart from each other in a lateral direction with a working space formed between the lifting devices,

each lifting device being transferable by at least one drive between a starting position that is near or on the floor and an operating position that is at a higher elevation than the starting position,

each lifting device comprises a carrier at an end region of the lifting device,

each carrier includes at least one support arm arranged pivotably thereon, so that the respective at least one support arms of the carriers are opposite one another on opposite sides of a vertical plane that passes between the two base assembly halves and bisects the working space in a longitudinal direction that is perpendicular to the lateral direction,

wherein the at least one support arms of each respective carrier is rotatable about a respective vertical rotation axis into the working space and toward or away from the vertical plane, and

wherein each respective at least one support arm is arranged on its respective carrier with an adjustable angle of inclination such that the vertical rotation axis of each at least one support arm is tiltable toward or away from the vertical plane so as to enable tilting of each respective at least one support arm relative to the floor and toward or away from the vertical plane in the working space.

2. The lifting platform according to claim **1**, wherein an adjustment device for adjusting the angle of inclination is provided for each base assembly half, the adjustment device being between the respective carrier and the respective lifting device and/or between the respective carrier and the respective at least one support arm.

3. The lifting platform according to claim **2**, wherein, each carrier is adjustable, by means of the respective adjustment device, for orienting each respective at least one support arm, in the inclination to a pivot axis of a respective pivot bolt or to a bearing axis of a respective bearing bolt, or to both.

4. The lifting platform according to claim **3**, wherein each adjustment device comprises a compensation plate with a borehole, which is placeable on an end of the pivot bolt or the bearing bolt and is fastenable on or in the carrier, through which a zero-point position or inclination of the respective carrier to the pivot bolt or bearing bolt or both is adjustable.

5. The lifting device according to claim **4**, wherein a retaining device is provided for fixating the compensation plate in the centering receptacle, which device is provided detachably on the lateral wall.

6. The lifting platform according to claim **5**, wherein the retaining device is configured as a retaining plate which

receives at least one detachable fastening element, through which the retaining device is fixated on the lateral wall.

7. The lifting platform according to claim **5**, wherein the retaining device receives at least one retaining element for fixation of the compensation plate to the retaining device.

8. The lifting platform according to claim **5**, wherein the retaining device receives at least one fixation element for detachable fastening of the retaining device to the pivot bolt or the bearing bolt.

9. The lifting platform according to claim **5**, wherein the retaining device configured as a retaining plate completely covers the centering receptacle in a position fastened to the lateral wall.

10. The lifting platform according to claim **4**, wherein the adjustment device includes multiple compensation plates which deviate from one another in the distance between a reference surface provided on the compensation plate and a longitudinal axis of the borehole.

11. The lifting platform according to claim **4**, wherein the pivot bolt and the bearing bolt are rotatably arranged, by means of a radial bearing, about a pivot axis and bearing axis, stationary to the load arm and guiding arm.

12. The lifting platform according to claim **1**, wherein a base assembly, stationary in the lifting of vehicles, is provided, which assembly includes the two base assembly halves, which are arranged fixedly to one another via at least one connecting point, with a middle part.

13. The lifting platform according to claim **12**, wherein the two base assembly halves are arranged to one another via at least one detachable connection point with the middle part.

14. The lifting device according to claim **1**,

wherein each lifting device of the two base assembly halves further comprises a respective load arm having a first end portion pivotably mounted to the respective base assembly half about a respective horizontal pivot axis, the respective load arms each extending from the first end portion to a second end portion of the load arm along a respective longitudinal axis that is transverse to the respective horizontal pivot axis, the respective load arms each being pivotable about the respective horizontal pivot axis by the at least one drive which raises or lowers the second end portion of the respective load arm relative to ground, and

wherein the respective carriers of the lifting devices are each mounted to the respective second end portion of the respective load, each respective carrier including two support arms that are each rotatable about respective vertical rotation axes to rotate the two support arms into the working space, wherein the respective vertical rotation axes of the two support arms of each carrier are offset from the respective horizontal pivot axis in the same longitudinal direction starting from the respective horizontal pivot axis, such that both of the vertical rotation axes of each carrier are on the same side of a lateral plane that extends through each horizontal pivot axis of the respective base assembly half, and which the lateral plane is perpendicular to the vertical plane that bisects the working space.

15. The lifting device according to claim **1**, wherein each lifting device of the two base assembly halves further comprises a respective load arm that is transferable by the at least one drive between the starting position that is near or on the floor and the operating position that is at a higher elevation than the starting position, and pivotable about the respective horizontal pivot axis by the at least one drive which raises or lowers the second end portion of the respective load arm relative to ground, and

wherein the working space is formed between the first and second load arms, and occupies a volume that (i) extends in the lateral direction which extends parallel to ground between the first and second load arms, (ii) extends in the longitudinal direction which is parallel to ground and perpendicular to the lateral direction, and (iii) extends in a vertical direction that is perpendicular to ground.

16. The lifting device according to claim **1**, wherein the at least one drive includes at least two drives, and wherein each assembly half includes one of the at least two drives for raising or lowering the respective lifting device.

17. A lifting platform for lifting vehicles, comprising:

two base assembly halves,

each base assembly half comprising a lifting device arranged thereon, in which the respective lifting devices are spaced apart from each other in a lateral direction with a working space formed at least between the lifting devices,

each lifting device being transferable by at least one drive between a starting position that is near or on the floor and an operating position that is at a higher elevation than the starting position,

each lifting device comprises a carrier at an end region of the lifting device,

each carrier includes at least one support arm arranged pivotably thereon, so that the respective at least one support arms of the carriers are opposite one another across the working space, wherein each respective at least one support arms is rotatable about a respective vertical rotation axis into the working space, and

wherein each respective at least one support arm is arranged on its respective carrier to tilt toward or away from the opposite at least one support arm of the other base assembly half by a tilting angle;

wherein each base assembly half includes an adjustment device that is configured to adjust the tilting angle of the respective at least one support arm;

wherein each adjustment device comprises a compensation plate with a borehole, which is placeable on an end portion of a pivot bolt or a bearing bolt and is fastenable on or in the respective carrier, through which a zero-point position or inclination of the respective carrier to the pivot bolt or bearing bolt or both is adjustable; and

wherein each carrier includes at least two lateral walls distanced to one another, which walls respectively comprise a perforation for the respective pivot bolt or the respective bearing bolt or both, and in that, in one of the lateral walls, at least one centering receptacle is provided, into which the respective compensation plate is insertable.

18. The lifting platform according to claim **17**, wherein the centering receptacle, in the lateral wall, has a V- or trough-shaped contour, narrows in a load direction, and the compensation plate has a complementary external contour and rests form-fittingly in the contour of the centering receptacle.

19. A lifting platform for lifting vehicles, comprising:

a first base assembly half having a first lifting device that includes a first load arm, and a second base assembly half having a second lifting device that includes a second load arm, the first and second load arms being spaced apart from each other in a lateral direction that is parallel to ground, in which a working region is formed between the first and second load arms, the

working region occupying a volume that (i) extends in the lateral direction between the first and second load arms, (ii) extends in a longitudinal direction that is parallel to ground and perpendicular to the lateral direction, and (iii) extends in a vertical direction that is perpendicular to ground;

the first lifting device being arranged on the first base assembly half, the first lifting device comprising:

the first load arm having a first end portion pivotably mounted to the first base assembly half about a first horizontal pivot axis, the first load arm extending from the first end portion to a second end portion of the first load arm along a first longitudinal axis that is transverse to the first horizontal pivot axis, the first load arm being pivotable about the first horizontal pivot axis by at least one drive that raises or lowers the second end portion of the first load arm relative to ground, in which the raising or lowering of the second end portion of the first load arm is within a first vertical plane that extends in the vertical direction and includes the first longitudinal axis, and

a first carrier mounted to the second end portion of the first load arm that is opposite the first end portion of the first load arm, the first carrier including at least two first support arms that are each rotatable about respective first vertical rotation axes to rotate the two first support arms into the working region between the first and second load arms, wherein the respective first vertical rotation axes are both offset from the first horizontal pivot axis in the same longitudinal direction starting from the first horizontal pivot axis, such that both of the first vertical rotation axes are on the same side of a lateral plane that extends in the lateral direction through the first horizontal pivot axis;

wherein an angle of inclination of the at least two first support arms is adjustable such that the respective first vertical rotation axes are tiltable toward or away from the second base assembly half so as to enable tilting of the at least two first support arms relative to the ground and relative to the first vertical plane; and

the second lifting device being arranged on the second base assembly half, the second lifting device comprising:

the second load arm having a first end portion pivotably mounted to the second base assembly half about a second horizontal pivot axis, the second load arm extending from the first end portion to a second end portion of the second load arm along a second longitudinal axis that is transverse to the second horizontal pivot axis, the second load arm being pivotable about the second horizontal pivot axis by the at least one drive that raises or lowers the second end portion of the second load arm relative to the ground, in which the raising or lowering of the second end portion of the second load arm is within a second vertical plane that extends in the vertical direction and includes the second longitudinal axis, and

a second carrier mounted to the second end portion of the second load arm that is opposite the first end portion of the second load arm, the second carrier including at least two second support arms that are each rotatable about respective second vertical rotation axes to rotate the two second support arms into the working region between the first and second load arms, wherein the respective second vertical rotation axes are both offset from the second horizontal pivot axis in the same longitudinal direction starting from the second horizontal pivot axis, such that both of the second vertical rotation axes are on the same side of the lateral plane that extends in the lateral direction through the first horizontal pivot axis and the second horizontal pivot axis;

wherein an angle of inclination of the at least two second support arms is adjustable such that the respective second vertical rotation axes are tiltable toward or away from the first base assembly half so as to enable tilting of the at least two second support arms relative to the ground and relative to the second vertical plane.

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